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ABSTRACT

This lesson plan was developed through "Economics International," an international program to help build economic education infrastructures in the emerging market economies. It provides a lesson description; appropriate age level; economic concepts; content standards and benchmarks; related subject areas; instruction objectives; time required for completion; materials needed; a detailed step-by-step procedure for classroom implementation; closure questions; an assessment exercise; and extension exercises. The lesson contains two visuals and two activities. Students read scenarios about the production of bibles over five historical time periods and then work to analyze factors that impact economic growth. (BT)

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National Council on Economic Education

Economics International

Active Learning Lessons

Centuries of Economic Growth – From Feathers to Robotics

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ACTIVE LEARNING LESSONS: CENTURIES OF ECONOMIC GROWTH - FROM FEATHERS TO ROBOTICS

Authors: Angela Bullock, USA; Sara Paul, USA;
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Lesson Description: Students will read scenarios about the production of Bibles over five historical time periods. Working in small groups, students create skits and develop a retrieval chart which is used to analyze factors that impact economic growth.

Age Level: 14-18 years old

Economic Concepts:

- Economic growth
- Labor productivity

Content Standard 15: Students will understand that investment in factories, machinery, new technology, and the health, education, and training of people can raise future standards of living.

Grade 12, Benchmark 1: Economic growth is a sustained rise in a nation's production of goods and services. It results from investments in human and physical capital, research and development, technological change, and improved institutional arrangements and incentives.

Content Standard 6: When individuals, regions, and nations specialize in what they can produce at the lowest cost and then trade with others, both production and consumption increase.

Grade 8, Benchmark 1: Labor productivity is output per worker.

Related Subject Areas: History, mathematics

Instruction Objectives: (Students will be able to:)

1. Define economic growth
2. Define labor productivity
3. Identify factors that contribute to increases in productivity

4. Explain the relationship between increases in productivity and economic growth

5. Explain why increasing productivity is important to an economy and individuals

Time Required: 2 class periods

Materials:

- A copy of Activities 1 and 2 for each student
- Transparencies of Visuals 1 and 2
- Transparency of Activity 1

Procedures:

Day One:

1. Tell students that for the next two days they will be studying factors that have influenced economic growth over time.

2. Use Visual 1 and display the definition for economic growth. Explain to students that economic growth means producing increasing amounts of goods and services over the long term. If the people in a nation want to experience an increase in their material standard of living, they must produce more goods and services. If output does not grow, one person or group can only obtain more goods and services if some other individual or group receives less.

3. Refer to Visual 1 and read the definition for labor productivity. Explain that to calculate labor productivity, output is divided by the time worked multiplied by the number of workers.

4. Model how to calculate labor productivity using the data in problem 1: Ten workers produce 30 cars in 3 hours. Instruct students to calculate labor productivity using these data. *(one car per hour)*

$$\frac{30 \text{ Cars}}{10 \text{ Workers} \times 3 \text{ hours}} = 1 \text{ car per hour}$$

5. Tell students to calculate the answer for problem two. *(15 cars)*

6. Distribute copies of Activities 1 and 2 to each student.

7. Divide students into five groups. Assign each group one of the five scenarios from Activity 2.

8. Instruct each group to read its assigned scenario and complete the appropriate section of Activity 1 for its time period.

9. Tell groups to create a skit that depicts the information in Activity 1 for their scenario. Inform groups that the skits will be presented at the beginning of the next class. Encourage students to bring in props.

Day Two:

1. Display Visual 2. Explain that as each group presents a skit, the remaining students are to complete Activity 2 for the appropriate time period using information from the skit.

2. Following each skit, have group members review the correct answers for Activity 1 with the class. Ask one member of the group to write the correct answers in the appropriate column on Visual 2.

3. Once all skits have been presented, discuss the following:

   a. What happened to labor productivity from 800AD to 2003? *(It increased.)*
   b. What factors contributed to this change in labor productivity? *(Education and training, improvements in equipment and technology.)*
   c. What impact does an increase in labor productivity have on economic growth? *(More output can be produced with the same amount of labor when labor productivity increases. When an economy produces more goods and services with available resources, economic growth occurs.)*
   d. What is necessary for an economy to experience economic growth? *(Investment in factories, machinery, new technology, and the health, education and training of people.)*
   e. How does an increase in a nation's economic growth affect the material standard of living of its people? *(The material standard of living for a society improves when an increase in real output of goods and services occurs. In the United States, as a result of the growth in real output relative to the growth of the population, the material standard of living has improved.)*
   f. Tell students that capitalist countries have experienced impressive economic growth during this century. In the United States, real output has increased 15-fold since 1900 while population has only tripled. Ask students: What does this mean for the average United States resident?

(Five times more goods and services are available to the average United States resident today than were available in 1900.)

Closure: Discuss the following:

1. What is economic growth? *(a sustained rise in a nation's production of goods and services)*

2. What is labor productivity? *(output per worker per hour)*

3. What factors contribute to an increase in labor productivity? *(investment in education and training, new technology and equipment)*

4. What is the relationship between productivity and economic growth? *(Economic growth results from increases in productivity.)*

5. Why are people in a society concerned about increasing productivity? *(When a society experiences increasing productivity, it can lead to improvement in the material standard of living for the people.)*

Assessment:

Display Visual 2. Ask students to write a short paragraph explaining why their president is concerned about this problem and what recommendations they would make to correct it. *(Low productivity growth over time means the country's standard of living is not rising. Recommendations should include investment in health, education and training of people, new technology and equipment, and new factories.)*

Extensions:

1. Select a country and compare the standard of living of individuals in this country over three time periods and explain the relationship between productivity growth and standard of living.

2. Gather current and historical data on real GDP per capita for four different countries such as the United States, Ukraine, Latvia, and Japan. Analyze the data and explain the relationship between economic growth and standard of living

Visual 1

Economic Growth: a sustained rise in a nation's production of goods and services

Labor Productivity: real output per worker per hour

Labor Productivity Formula:

Labor Productivity =

$$\frac{\text{Output}}{\text{Time Worked } \mathbf{x} \text{ Number of Workers}}$$

Use this formula to answer the problems below.

1. Ten workers produce 30 cars in 3 hours. What is the labor productivity rate per worker?

2. If 2 workers produce 60 cars in 2 hours, what is the labor productivity rate per worker per hour?

Visual 2

Assessment

At a recent news conference, your president expressed grave concern over the lag in productivity for the previous four quarters. She has asked you to write a brief paragraph for the press on why this is a problem for your country and what needs to occur to correct the situation.

ACTIVITY TWO: SCENARIOS

Scenario One: 800 AD

Your name is Peter. You are a 9th century monk. Based on your successful completion of an apprenticeship program under a master scribe, the authorities have requested your services to produce Bibles. You must pay great attention to detail as many of the letters are created with magnificent color and ornate shapes. Your necessary equipment and supplies include parchment paper, feather pens, and ink. It is difficult for you to focus on the details of your creation as you do not own spectacles (eyeglasses). You work in your home for 10 hours per day, from dusk until dawn, under candlelight. This job requires you to work 300 days per year and it takes seven years for you to complete one Bible.

Scenario Two: 1790s

Your name is Johanne. After completing an extensive apprenticeship program to acquire the necessary skills to run a printing press, you now produce Bibles in your small print shop. Letters are made of lead and a special powder is used to dry the paper after it runs through the press. Your craft involves typesetting methods, which is time consuming; therefore, you work ten hours per day, which enables you to produce 300 Bibles in 150 days.

Scenario Three: 1920s

Your name is Frank. You own a large printing house. You have specific training in printing operations. Your printing house specializes in mass production. You have engineers on staff to correct problems that occur with the assembly line. The type set is automated; therefore, you produce 100 Bibles in each ten-hour shift.

Scenario Four: 1995

Your name is Angie. You have a four-year Liberal Arts degree. You work for Gothem Press, which is a state-of-the-art printing company. You received three months of on-the-job training learning how to program the computer system and how to coordinate the production of workers. Books, including the Bible, are produced at a rate of 1000 books per worker per hour.

Scenario Five: 2003

Your name is Christoff. You live in Kiev but work for an American publisher. You are extremely qualified for this position after extensive training at the State University of Kiev. Your job involves networking robotic technology and troubleshooting glitches in the computer program. All of the computers used to produce Bibles in each of the five plants can be accessed from your home in Kiev. You produce one million Bibles per hour with the help of robotic technology, which you coordinate from your home office.

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Answers

Activity One

Factors Contributing to Economic Growth

Retrieval Chart

Factors	800 AD	1790	1920	1995	2003
1. Labor Productivity P = Output Time x # Workers	Output = Time = Worker = P =	Output = Time = Worker = P =	Output = Time = Worker = P =	Output = Time = Worker = P =	Output = Time = Worker = P =
2. Investment in Human Capital Training and Education					
3. Investment in Physical Capital a. Equipment b. Technology					

Factors	800 AD	1790	1920	1995	2
1. Labor Productivity P = Output Time x # Workers	Output = 1 Bible Time = (7x300x10)	Output = 300 Bibles Time = 150x10	Output = 100 Bibles Time = 10 hours	Output = 1,000 Bibles Time = 1 hour	Output 1,000 Time

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	Worker = 1 P = .0000476 Bibles per hour	Worker = 1 P = 2 Bibles per hour	Worker = 1 P = 10 Bibles per hour	Worker = 1 P = 1,000 Bibles per hour	Worke P = 1, per hc
2. Investment in Human Capital Training and Education	Apprenticeship Program	Apprenticeship Program	Trained in printing operations. Trained engineers on staff.	Liberal Arts Degree 3 months on-the-job training	State of Kie
3. Investment in Physical Capital a. Equipment b. Technology	Pens, candlelight Simple, primitive, done by hand	Print Shop press Special powder used to dry paper Typesetting methods	Printing House Mass production (assembly line) Automated typeset	Computer system Coordinating production of workers	5 Plar Home Netwc roboti techn Troub glitche compu progra

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